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**RESPONSIVENESS SUMMARY  
FOR THE  
PROPOSED REMEDIAL ACTION PLAN  
AT THE  
MEDLEY FARM SUPERFUND SITE  
GAFFNEY, SOUTH CAROLINA**

Public Comment:  
February 13 through April 14, 1991

May 1991

Prepared for:  
U.S. Environmental Protection Agency  
Region IV

MEDLEY FARM SUPERFUND SITE

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RESPONSIVENESS SUMMARY  
FOR THE  
PROPOSED REMEDIAL ACTION PLAN

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ATTACHMENTS

- Attachment A - Transcript of Public Meeting
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- Attachment C - List of Local Community Members at Public Meeting
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- Attachment E - Letter from Medley Farm Site Steering Committee to EPA, dated April 12, 1991
- Attachment F - Letter from EPA to Steering Committee, dated May 6, 1991

**RESPONSIVENESS SUMMARY**  
**for the U.S. EPA Region IV**  
**Medley Farm Superfund Site Public Meeting**  
**Gaffney High School, Gaffney, South Carolina**  
**February 12, 1991**

This community relations Responsiveness Summary is divided into the following sections:

Overview: This section discusses EPA's preferred alternatives for remedial action.

Background: This section provides a brief history of community interest and concerns raised during remedial planning at the Medley Farm Superfund Site.

Part I: This section provides a summary of major issues and concerns received in the comments, and expressly acknowledges and responds to those raised by the local community. "Local community" may include local homeowners, businesses, the municipality, and not infrequently, potentially responsible parties (PRPs).

Part II: This section provides a comprehensive response to all significant comments and is comprised primarily of the specific legal and technical questions raised during the public comment period. If necessary, this section will provide technical details on answers presented in Part I.

**OVERVIEW**

EPA published its preferred remedial alternative for the Medley Farm Superfund Site, located in Gaffney, South Carolina in the Proposed Plan Fact Sheet, mailed to the public on February 8, 1991, and in the public notice published in the Greenville News on February 10, 1991 (refer to Attachment D). The February 12 public meeting initiated the public comment period. EPA's preferred alternative addresses contamination of the groundwater and surface soils around the Site. The preferred remedy includes the following technologies as described in the Feasibility Study completed in April 1991:

- Treatment Using Air Stripping: Recovery of groundwater above maximum contaminant levels (MCLs) and treating the extracted groundwater through an air stripping tower prior to discharging to Jones Creek via a National Pollutant Discharge Elimination System (NPDES) permit. If necessary to comply with applicable portions of the Clean Air Act and the South Carolina Pollution Control Act, the off-gas will be controlled using an activated carbon unit.

- Soil Vapor Extraction: Employ soil vapor extraction in areas exceeding calculated soil remediation levels. If necessary to comply with applicable portions of the Clean Air Act and the South Carolina Pollution Control Act, the extracted vapors will be controlled using an activated carbon unit.

EPA's preferred alternative for addressing groundwater contamination involves extracting or removing contaminated water from the upper and bedrock portions of the aquifer using extraction wells and treating the contaminated water by air stripping. Air stripping is a process in which air is forced through contaminated water, causing volatile organic compounds (VOCs) to evaporate. Once this process is completed, extracted groundwater will be discharged to Jones Creek via an NPDES permit.

EPA's preferred alternative for addressing contaminated soils is soil vapor extraction (SVE). As proposed, the SVE treatment process will remove VOCs and some semi-volatile organic compounds (SVOCs) from the soil. A vacuum extraction system consists of a network of air withdrawal (or vacuum) wells installed in the unsaturated zone. A pump and manifold system of pipes is used to apply a vacuum on the air wells that feed an in-line water removal system, and an in-line vapor phase carbon adsorption system for VOC and SVOC removal. Vacuum wells can either be installed vertically to the full depth of the contaminated unsaturated zone or installed horizontally within the contaminated unsaturated zone. Vertical wells were selected at this Site due to the depth of the soil strata requiring remediation, geotechnical conditions, and the depth to groundwater.

Although the Risk Assessment indicates that the soil, under present conditions, does not pose an unacceptable risk to human health or the environment, the remediation of soils is required as the soils will continue to adversely impact the groundwater flowing beneath the Site above acceptable levels. Therefore, the Agency has determined that SVE is warranted to remove contaminants from the soil.

#### **BACKGROUND**

Community interest and concern about the Medley Farm site has been moderate over the past several years. EPA has sponsored a number of public meetings and released six fact sheets to help the community understand its role in the Superfund process and to share information regarding the direction and technical objectives of data collection activities at the Site. A broad cross-section of the community has been represented at these meetings, including local government officials, community residents, and the PRPs.

To obtain public input on the Agency's proposed plan for remedial action at the Medley Farm site, EPA held a public comment period from February 13, through April 14, 1991. The public comment period, originally scheduled to end March 14, 1991, was extended 30 days at the request of the community, to allow additional time to comment on the proposed plan.

The following section provides details on the accumulative community relations efforts conducted by the Agency. Information Repositories/Administrative Records were established at the Cherokee County Public Library in Gaffney and in the EPA, Region IV Regional Information Center in Atlanta, Georgia. A Community Relations Plan identifying a positive public outreach strategy was developed. The primary vehicle of disseminating information to the public was through fact sheets and public meetings.

The first two Fact Sheets were distributed to the public during the latter part of 1988. The first Fact Sheet, released in October 1988, provided pertinent background and historical information, and a brief description of the Superfund process. The second Fact Sheet, distributed in December 1988, described the upcoming RI field activities and provided a schedule of work.

Following the submittal of the draft RI report to the Agency by the PRPs on March 30, 1990, a third Fact Sheet was prepared. This Fact Sheet, distributed in May 1990, highlighted the findings/conclusions stated in the draft RI report. Due to the data deficiencies identified in the draft RI report, a fourth Fact Sheet was mailed to inform the public that a second phase, Phase II, of the RI was necessary. Following the completion of Phase II and the submittal of the revised RI report on November 30, 1990, another Fact Sheet was prepared and distributed to the public in January 1991. This Fact Sheet highlighted the findings/conclusions stated in the revised RI report. Shortly after distributing this Fact Sheet the Proposed Plan Fact Sheet was sent out to the public on February 8, 1991.

In addition to the distribution of these fact sheets, the Agency conducted three public meetings. The first public meeting, the "Kick-Off" meeting, was held on January 9, 1989. A second public meeting was held on May 24, 1990 to share with the public the information presented in the draft RI and inform the public of the upcoming activities and provide a schedule for these activities. The Proposed Plan public meeting was held on February 12, 1991.

Public notices highlighting the proposed plan and availability of the administrative record appeared in the Greenville News on February 10, 1991. Another notice announcing the extension to the public comment period also appeared in the Greenville News on March 19, 1991. A copy of these public notices can be found in Attachment D.

#### **PART I: SUMMARY OF MAJOR ISSUES AND CONCERNS RECEIVED AS COMMENTS**

This section provides a summary of major issues and concerns received as comments, and expressly acknowledges and responds to those raised by the local community. The major issues and concerns on the proposed remedy for the Medley Farm Site received at the public meeting on February 12, 1991, and during the public comment period, can be grouped into three areas:

- A. Identification and involvement of PRPs,
- B. Cleanup costs, and
- C. Selection of a remedy.

A summary of the comments and EPA's responses are provided below. A complete transcript of concerns raised during this segment of the meeting, along with the responses, is included on pages 14-18 of the meeting transcript (Attachment A). Jon Bornholm, Remedial Project Manager for EPA, Region IV, responded to all questions.

#### Identification and Involvement of PRPs

Q: What companies, individuals, or other parties have been named as PRPs and will there be any criminal charges filed against them?

A: According to the Administrative Order, the following parties were named prior to the Risk Assessment: Milliken and Company; Unisphere Chemical Corporation; National Starch and Chemical Corporation; ABCO; BASF Corporation; Polymer Industries; Tanner Chemical Company, and; Ethox Chemical, Inc. The Medleys, including Ralph and Clyde Medley, were subsequently added to the list. To the best of my knowledge, I do not know if there will be any criminal charges filed against them.

Q: Is the Agency going to recover the cost of the initial cleanup from the PRPs?

A: The majority of the cleanup costs is coming from the PRPs and has been recovered. The PRPs have paid for all the investigation work completed to date. The only costs the government has incurred right now are oversight costs, and EPA will also be seeking to recover those costs from the PRPs.

Q: Will the EPA have to enter into negotiations with the PRPs?

A: After the Agency publishes its decision, it then issues special notice letters to all of the identified PRPs to begin negotiations on the RD and RA, which usually lasts six months. A Consent Decree, summarizing the results of those negotiations, is then produced and becomes a record in the Federal court system. If a decision cannot be reached during the six-month period of negotiations, the EPA will issue a Unilateral Administrative Order (UAO), forcing the PRPs to implement a new RD and RA. If the PRPs refuse to comply with the UAO then Superfund will be implemented and the PRPs will become liable for further damages.

#### B. Cleanup Costs

Q: How much is the cost of the cleanup?

A: The FS presented several scenarios. The 10-year and 30-year scenarios for the extraction and treatment of groundwater are estimated to be \$1.2 million and \$1.9 million, respectively. The

cost to treat the source through soil vapor extraction is set at \$550,000, a process which is estimated to be complete in one year. Therefore, the total present cost for the 10-year and 30-year scenarios for groundwater extraction and treatment with soil vapor extraction is \$1.8 million and \$2.4 million, respectively.

Q: What is the significance of the 10-year and 30-year scenarios?

A: The remediation of groundwater is not a science. Sirrine Environmental Consultants estimated that it will take 20 years, under natural conditions, for the flushing of soils by rain to clean the soils down to a level where there is no longer any natural groundwater. Over those 20 years, the groundwater also will be treated to remove those contaminants entering it. The purpose of the soil vapor extraction system is to shorten the period where organics are allowed to enter the groundwater. The selected RA would cost at least \$1.8 million for the 10-year scenario and \$2.4 million for the 30-year scenario.

#### C. Selection of Remedy

##### Comment:

"Soil vapor extraction (SVE) (Alternative SC-3) should be eliminated from the plan for remedial action because it is neither necessary for compliance with ARARs nor cost-effective". According to the entity commenting, the great majority of chemical residues at the Site were removed during the immediate removal action in 1983. The entity commenting noted three problems with the proposed remedy:

- Site conditions are consistent with aquifer and contaminant characteristics that are likely to prolong aquifer restoration. Therefore, the time necessary for cleanup will apply to pump and treat the groundwater after the natural flushing period is underestimated in the EPA proposal;
- Remediation is not necessary for compliance with ARARs because all Site soils are less than the TSCA remediation level and they do not pose a significant risk to human health or environment; and
- The estimated costs for remediation do not consider the longer remediation period required for the EPA preferred remedy, therefore cost savings are not accurate".

The entity commenting proposed that EPA instead use natural flushing (Alternative SC-1) combined with groundwater recovery and treatment (Alternative GWC-2A) as the remedy for the Site. The entity commenting suggests that groundwater extraction alone can prevent potential future risks, is technically justifiable based on EPA experience, and in conjunction with natural flushing is the most cost-effective remedy for the Site.

The letter to EPA documenting these comments on the selection of a remedy, dated April 12, 1991, is attached as Attachment E to this summary.

Response:

It is the Agency's opinion that the selected remedy is the best overall choice for remediation of both soil and groundwater at the Site. The natural flushing alternative is not acceptable because:

- The time necessary to pump and treat the groundwater after the natural flushing period is underestimated;
- Cost savings from the commenting entity's proposal may not be substantial and do not justify reliance on natural flushing; and
- Technical publications strongly recommend addressing residual source areas using a companion technology with pump-and-treat, such as SVE.

EPA believes that eliminating the residual source areas by using SVE is more logical than using natural flushing, since the areas are a potential problem which would likely affect the pump-and-treat system.

In reviewing the feasibility of a remedy, EPA is required by legislation to consider two criteria not addressed in the entity's comments: State and community acceptance of the remedy. State and community representatives will not support a natural flushing, or "No Action", scenario. In fact, the South Carolina Department of Health and Environmental Control (SCDHEC) has concurred with and supports the selected remedy. It is therefore the Agency's opinion that the selected remedy is the best overall choice for remediation of both soil and groundwater at the Medley Farm Site.

**PART II: COMPREHENSIVE RESPONSE TO SIGNIFICANT COMMENTS**

This section provides a comprehensive response to all significant comments on the Medley Farm Superfund Site received during the public comment period. The information presented in this section provides technical details for issues discussed in Part I, specifically, issues raised regarding the selection of a remedy for the Medley Farm Superfund Site. Technical issues are discussed in terms of the following:

- Duration of the Response Action,
- Cost Estimates, and
- Companion Treatment System.

This discussion is presented in the section below.



#### Duration of the Response Action

The Agency does not dispute the findings of the studies researched by the entity commenting that the time required to pump and treat groundwater with residual soil contaminants removed during the first year is underestimated. The underestimation of time, however, also applies to pump and treat groundwater 20 years in the future to remove the residual contaminants entering the groundwater (natural flushing), not just SVE.

The assumption that a 50% reduction in the concentrations of residual contaminants present in the groundwater will be needed may not hold true, since there are uncertainties associated with the assumptions required by the computer models. Treating contaminants that enter the groundwater in the 20th year of natural flushing by the groundwater pump-and-treat system could take an additional 10 years to be removed from the aquifer. The difference in time frames between the natural flushing alternative and the SVE alternative will be therefore greater than 11 years. In addition, further pump-and-treat time may be necessary to remove the last contaminants entering groundwater, and contaminants may continue to enter the groundwater beyond 20 years. This would delay further the attainment of cleanup goals.

#### Cost Estimates

The entity commenting claims that the cost estimates are inaccurate because they are based on estimates of the duration of the remedial action. If only five years were required to bring residual concentrations down to MCLs, the additional costs for groundwater remediation at present worth costs would be \$539,000; if eight years were required they would be \$601,000; and if ten years were required they would be \$638,000. Since the present worth cost for SVE is \$620,000, the estimated savings generated by natural flushing are thus not greater than \$200,000, but rather more likely range between \$0 and \$81,000. These savings are not substantial when measured against the estimated total cost (net present worth) of the remedy, or \$1.2 million for 10 years and \$1.8 million for 30 years, and are not enough to justify selecting natural flushing as a source control remedy.

#### Companion Treatment System

EPA technical publications (refer to EPA letter, included as Attachment F, for relevant publications) recommend that any and all residual source areas be removed or addressed by a companion treatment system to enhance and improve the effectiveness of pump-and-treat systems. These publications support the Agency's opinion that preventing or minimizing the contaminant mass from moving from the unsaturated zone to the saturated zone makes more economic and environmental sense than waiting for the contamination to enter groundwater and then attempting to remediate the contamination.

**ATTACHMENT A - MEETING TRANSCRIPT**

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

MEDLEY FARM SUPERFUND SITE  
PROPOSED PLAN PUBLIC MEETING

TUESDAY, FEBRUARY 12, 1991

7:00 O'CLOCK P.M.

GAFFNEY HIGH SCHOOL  
GAFFNEY, SOUTH CAROLINA

5 2 0012

1 MR. JON BORNHOLM: Good evening. It's a  
2 few minutes after 7:00 o'clock. I'd like to welcome you this  
3 evening. I'm John Bornholm. I'm with the Environmental  
4 Protection Agency and I'll be conducting this meeting this  
5 evening.

6 There are a few  
7 people that I'd like to introduce. Mr. Ralph Howard with the  
8 Environmental Protection Agency and Mr. Glenn Adams, also  
9 with the Agency, is present tonight. Ms. Cynthia Peurifoy,  
10 and I've probably done a bad job of pronouncing her name, is  
11 the Community Relations Coordinator for the Environmental  
12 Protection Agency.

13 I'd like to explain  
14 the graphs that I will be presenting on the screen tonight.  
15 This is the Medley Farm Site, the location of the site. This  
16 is the Town of Gaffney. It's about six miles down the road.  
17 Most of these that I'm going to be showing you have been  
18 taken out of the draft remedial investigation or the draft  
19 report that has been prepared for the responsible parties by  
20 Sirrine Environmental Consultants.

21 We're going to go  
22 through the superfund project itself. Site discovery, PRP  
23 search and the ranking of the site, the responsible,  
24 potentially responsible parties, the latter part of '87, the  
25 potentially responsible parties signed what we call an

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Administrative Order on Consent, which we viewed with the feasibility study in January of '88 and this will be based on our input from the public on this meeting, and the remedial investigation, to develop what we call a regular decision or a ROD. We expect right now to have that regular decision signed by our administrator at the end of March. Following that we enter into negotiations with the potentially responsible parties again, to try to convince them of the remedial design. Following that decision we enter into the actual environmental cleanup.

Something I forgot to mention. There are some handouts on the front table that basically have all the overheads that I will be using. I'm sorry I forgot to mention that beforehand.

This is what we call a time line that identifies the activities that occur. What I've highlighted in red is this meeting tonight, which is what we call the public meeting. Tonight is our public comment period, which is where we encourage the public to voice their opinion with regard to the Medley Farm site. The public period ends March 15th. If an additional thirty days is requested by the public, we would extend it another thirty days. That would extend it to April 15th. Again, this is being made a part of the record this evening. Our responsiveness summary, a transcript from tonight's meeting

5 2 0014

1 and all public comments and our responses to those public  
2 comments. That's part of our record. It becomes part of  
3 this public meeting. Then it goes in the decision stage,  
4 signed by our regional administrator and it goes into the  
5 remedial design negotiations, which is approximately a six  
6 month time frame. There is negotiation with the potentially  
7 responsible parties and then if that fails there is a filing  
8 with the Federal Court, and then following that we go into  
9 the Court. That gives you an idea of our time frames.

10 The next is the  
11 remedial objectives of the investigation; that is to identify  
12 the contamination in both the soil and the groundwater. This  
13 will give you an idea of the characteristics of the environ-  
14 mental mediums at the site, the soils, the bedrock, to  
15 determine chemical, physical and hydrogeological  
16 characteristics; to determine the presence or absence of  
17 source areas. Again, we looked at the impact it would have  
18 on Jones Creek and to identify any of those potential  
19 contaminants to the public.

20 To accomplish that  
21 the EPA proposed to take soil borings. The results of that  
22 were published in April, I believe, of '90.

23 And these little  
24 circles are the locations of surface water and the soil  
25 boring locations.

5 2 0015

1 This is just a review  
2 of what they found at the site from the remedial investiga-  
3 tion. The soils of the disposal areas are contaminated with  
4 volatile compounds at the site, as well as semi-volatile  
5 compounds. Groundwater at the site and downgradient are con-  
6 taminated with volatile compounds again. Metal was detected  
7 in groundwater, but that is natural occurring. The levels  
8 detected did not pose a risk. The groundwater is moving in a  
9 southeasterly direction and the sprouse well is hydraulically  
10 upgradient of the site. There were no contaminants found in  
11 Jones Creek. And Jones Creek is running through here.

12 And this overhead  
13 shows the contaminants found in the bedrock portion of the  
14 aquifer. Disposal activities occurred up in this area.

15 And this overhead  
16 shows the direction of flow of water in the bedrock portion  
17 of the aquifer and the contaminants in the southeastern  
18 direction towards Jones Creek.

19 Basically this shows  
20 the contaminants found in the soils at the site. Again,  
21 that's volatile as well as semi-volatile organic compounds at  
22 the site.

23 This gives you the  
24 chemicals detected. The volatile organic compounds, 1,1,2-  
25 Trichloroethane; out of thirteen it was detected in two of

5 2 0016

those detections. The second column, that gives you the range of detected concentrations found.

This schedule shows the chemicals found in saprolite wells and this schedule identifies the chemicals found in the bedrock wells, including the number of detections and the frequency of detections.

Part of the remedial investigation is called a risk assessment objectives. Basically this looks at the contaminants detected, where they were detected and what possible pathway those contaminants have to reach either the environment or the public. And we have quantitative as well as a qualitative.

Based on the information provided during the remedial investigation, the risk document, under today's conditions, the site does not pose a risk to either public health or the environment. The feasibility study states that the site does not pose a risk in the future; that PRPs or potentially responsible parties need to go back and re-evaluate that if we feel that the groundwater, under a scenario of the site becoming a residential area, is considered.

The objectives of the feasibility study is to look at potential technology to clean up the site, and then narrowing down from that laundry list



5 2 0017

1 the technology that are applicable to the site. There are  
2 several screening factors for criteria used on the  
3 technology. And then once you've cleared that, you go down  
4 to a smaller list, and then we go into a more detailed  
5 evaluation of those alternatives, which uses nine criteria to  
6 evaluate alternatives. They basically are threshold criteria  
7 ...let me back up. There are three levels of criteria. The  
8 first one is threshold criteria. These must be met by the  
9 alternatives. The first one being the overall attention to  
10 human health and the environment and the second one is in  
11 compliance with applicable or relevant and appropriate  
12 requirements, which we call ARARs. That's actually...  
13 A-R-A-R-S. We take these criteria and we look at them under  
14 what we call primary balancing criteria and those are long  
15 term effectiveness and permanence; reduction of toxicity,  
16 mobility or volume; implementability; short term effective-  
17 ness and then cost.

18 I'd like to briefly  
19 go through that whole process. Potential groundwater  
20 remediation technology at the site, considering the no action  
21 alternative at all sites based on the risk assessments, which  
22 is a Baseline Risk Assessment. Groundwater recovery. We had  
23 certain types of ways we could recover groundwater;  
24 extraction wells, subsurface trenches and drains and  
25 alternative concentration limits. We have identified several

5 2 0018

ways of treating that groundwater once it is extracted from the ground. One is air stripping, activated carbon, chemical oxidation, land treatment and biological treatment. And once we have it out of the ground we need to do something with it after it is treated. Discharge of extracted groundwater. There is the surface water discharge; pump it through the local sewer plant; discharge it out through an irrigation process or into injection wells on the site. And potential soil remediation technologies; again the no action alternative. In-situ treatment, treatment in place; soil vapor extraction, enhanced biodegradation, soil flushing and vitrification. And also the off-site treatment or disposal; incineration or disposal at an approved hazardous waste site. And then containment, which is capping, slurry walls around the containment, grouting, sheet piling around it or bottom sealing.

The groundwater control technology summary, the ones highlighted in red, as to what was actually kept as far as potential alternatives to clean up the site. And then a rough cost estimate was performed for each of those alternatives and based on those cost amounts, several alternatives were eliminated. What these alternatives consist of, again, no action at the site, let nature take its course. The second one is no action; long term monitoring, which consists of, again, letting

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1 nature take its course, but we would require occasional  
2 sampling of the monitoring wells to address or to measure how  
3 quickly mother nature is cleaning up the site as well as to  
4 make sure we didn't miss anything or take care of something  
5 that might come up down the road. The next is what we call  
6 MCLs, which are maximum concentration levels or limits, and  
7 those are levels of contaminants allowable in drinking water.  
8 Under this scenario the pump and treat system would have to  
9 attain that level or be above that level across the entire  
10 site and it was estimated that this scenario would include or  
11 would exceed up to pumping thirty gallons of groundwater per  
12 minute. And then for treatment of that extracted  
13 groundwater, air stripping prior to discharge to Jones Creek.  
14 The fourth alternative for groundwater that was considered  
15 was the MCLs at the property line of the site and then  
16 treating that extracted groundwater with air stripping prior  
17 to discharging the groundwater to...or the treated ground-  
18 water to Jones Creek. This was estimated to be fifty gallons  
19 per minute. For source control, there was a no action  
20 alternative. On the second scenario for soils, there is  
21 capping the source area. That would prevent rain from  
22 infiltrating the soils and therefore washing the contaminants  
23 further down in the groundwater. And the third alternative  
24 is soil vapor extraction. That would be installing wells  
25 into the saturated soils on the site, putting a vacuum on

5 2 0020

those wells and drawing the organics out, which puts air in and allows those to be drawn up and out.

Based on the information provided in the feasibility study, basically the remedy that the EPA has selected as the preferred alternative is right here for groundwater. I think on the page that...I think this page is not in the packet. It's a loose page, unfortunately, that did not get attached; so if you'll pick one up on the way out, that would be appreciated. Basically during the remediation of the site, wells need to be sampled on a periodic basis to insure that, one, we have captured the groundwater and, two, to measure the possible remediation; Installation of a groundwater extraction system, in this case we're proposing wells, extraction wells; treating the extracted groundwater through an air tower to remove the volatile organics and then discharging that treated groundwater to Jones Creek via an NPDES Discharge Permit. NPDES stands for National Discharge...National Pollutants Discharge Elimination System. That's what NPDES stands for. I have a note here. Metal is more...the standard for discharging surface water is more stringent for metal than for organics and the levels of metal that may be in the groundwater, that are in groundwater, may cause a problem in surface waters to aquatic life; so treatment for metal may be necessary in order to meet that discharge permit requirement. And that's

5 2 0021

1 why I have that little thing in parenthesis there. And then  
2 there is essentially a catch all to re-evaluate the  
3 monitoring system that exists on site today to make sure that  
4 we're not missing anything. And then there is the deed  
5 restrictions, which would prevent somebody from installing a  
6 drinking well on the site.

7 And for source  
8 remediation, to install a network of air withdrawal or vacuum  
9 wells in those areas that were identified as containing  
10 levels of contaminants high enough to impact groundwater. As  
11 I explained before, you put a vacuum on those wells to create  
12 a air flow through the system to remove the organics up and  
13 through the wells, and then prior to discharge, or the  
14 initial start-up of the system, it will probably be  
15 generating quantities of organics out of the soil, and the  
16 extracted air will be sent through an activated carbon filter  
17 process prior to being discharged into the environment.

18 And then we will  
19 sample surface water and sediment in Jones Creek as well as  
20 the tributaries to Jones Creek to make sure the system is  
21 working; so if we're missing something with our groundwater  
22 tracking system, we would anticipate seeing it entering this  
23 surface water.

24 Basically the two  
25 groundwater extraction systems considered in the feasibility

5 2 0022

study were, one, putting a line of groundwater extraction along these two lines. This line would result in containing the NCLs across the site, which would, as I mentioned earlier, result in a thirty gallon per minute flow for groundwater. The second alternative considered in the feasibility study was this second line, the other line of extraction. This system would meet NCLs at the property boundary and result in a flow out of the ground of fifty gallons per minute. This little red box is a location of where the groundwater treatment system would be installed and would discharge, with piping, down to Jones Creek, which would be down here somewhere. It would be off the map.

This map shows those areas in the soils where concentrations of organics in soils will continue in groundwater above the maximum concentration level, and these are the areas where the soil vapor extraction system would be employed.

And this is just a schematic of the soil vapor extraction system. You have your extraction wells, your vapor extraction wells all tied into a central central manifold, which is attached to some type of suction, via a pump or blower, which is then tied into the treatment system, because you're also going to be extracting water vapor as well, which will be collected and pumped off and then the air stream will be piped through an activated

5 2 0026

carbon filter to remove the volatile organics and semi-volatile organics from that air stream prior to releasing that air stream through the environment.

And I think some of the names got misspelled on it. If further information is requested or desired, I am the primary contact for the Agency. Richard Haynes is the primary contact for the State, South Carolina Department of Health and Environmental Control.

One other thing I need to mention, the Agency also has what we call a Technical Assistance Branch Program, which basically gives money, under certain conditions, that has to be met, to the public in order for the public to hire its own consultant to basically review the findings, all the documents in the superfund site, and then provide that information to the public in maybe a more understandable meaning. But that grant is available. It's made available for all superfund sites, and the contact for a technical assistance grant is Denise Bland, and that's her address and telephone number.

Basically that's really my presentation. Again, this meeting is being reported by a court reporter. We need to get an accurate transcript. I am opening the floor for any questions. Should you have a question, please state your name so that

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the court reporter can get an accurate account of it, and please speak up loud enough so that she can hear your question so that she can put that down on paper as well. Are there any questions?

MR. CODY SOSSAMON: Cody Sossamon. What companies or individuals have been named, individual companies or parties, and will there be any criminal charges filed against them in this?

MR. JON BORNHOLM: Okay, the responsible parties I have at this time, the Administrative Order, are Milliken and Company, Unisphere Chemical Corporation, National Starch and Chemical Corporation, Abco, BASF Corporation, Polymer Industries, Tanner Chemical Company, Ethox Chemical, Inc., and there are several others that were not identified prior to the remedial action.

MR. CODY SOSSAMON: Are any of the Medleys identified?

MR. JON BORNHOLM: The Medleys are also identified as potential possible parties.

MR. CODY SOSSAMON: And Ralph Medley?

MR. JON BORNHOLM: Ralph and Clyde are both identified as a potential possible party, too.

MR. CODY SOSSAMON: Do ya'll plan to bring criminal charges?

MR. JON BORNHOLM: To the best of my



5 2 0025

knowledge I do not know. I cannot say.

MR. CODY SOSSAMON: Are ya'll going to try to recover the initial clean-up cost in this?

MR. JON BORNHOLM: My understanding is that the majority of our clean-up costs is coming from the responsible parties.

MR. CODY SOSSAMON: From those that you named?

MR. JON BORNHOLM: From the ones that I listed off, yes. How much each contributed, I do not know.

MR. CODY SOSSAMON: You don't know the exact amounts?

MR. JON BORNHOLM: I don't remember all of them, but I know that the majority of our costs have been recovered.

MR. CODY SOSSAMON: What have they paid for?

MR. JON BORNHOLM: The potentially responsible parties have paid for all the investigation work done to date. The only costs that the government has incurred right now are oversight costs and we will also be seeking to recover those costs from the responsible parties as well. Are there any other questions?

MR. MATT STAHL: Matt Stahl with the Spartanburg Herald Journal. How much is the cost of the

5 2 0026

clean-up? I know we've seen some figures, but just how much is the cost?

MR. JON BORNHOLM: The costs generated from the feasibility study, several scenarios were put out. The first, a ten year scenario for this pumping and treating of groundwater was calculated, and just to round off numbers, that was estimated to 1.2 million dollars. And that's on the construction of groundwater remediation by itself. The same thing, groundwater remediation by itself, over a thirty year period, again for construction for that system, it's estimated to be 1.9 million dollars. For the source remediation, soil vapor extraction process, the present costs were set at \$550,000.00 and it was estimated to take one year to do contamination soil samples; so basically if you put those numbers together, the present costs for ten years of pump and treat with soil vapor extraction, it's 1.8 million dollars. For groundwater extraction and treatment over a thirty year period, along with soil vapor extraction, it was estimated to be 2.4 million dollars.

MR. CODY SOSSAMON: The ten years and the thirty years, I'm not quite clear on what the...

MR. JON BORNHOLM: The significance of that?

MR. CODY SOSSAMON: Yes.

MR. JON BORNHOLM: The remediation of

5 2 0027

1 groundwater is not a science; so basically what this is doing  
2 is to look at the process over a thirty year period and try  
3 to generate some costs that would take care of the remedia-  
4 tion period. The idea here, at least for Medley Farms, is  
5 that it's been estimated by Sirrine that it will take twenty  
6 years, under natural conditions, for the natural flushing of  
7 soils by rain to clean the soils down to the level where  
8 there is no longer any natural groundwater. That's twenty  
9 years. And at the same time they're going to be treating and  
10 pumping over that twenty years to remove those contaminants  
11 that will be entering the groundwater. The purpose of the  
12 soil vapor extraction system is to try to shorten that period  
13 of allowing organics to enter the groundwater, and hopefully  
14 they can shorten that period. Did that answer your question?

15 MR. CODY SOSSAMON: Yes, I think so.

16 MR. JON BORNHOLM: That's how long it  
17 takes to accomplish that.

18 MR. CODY SOSSAMON: So the least it would  
19 cost then is 1.8 million for ten years and 2.4 million for  
20 thirty years?

21 MR. JON BORNHOLM: Correct.

22 MR. CODY SOSSAMON: If it takes thirty  
23 years it would go a little bit more?

24 MR. JON BORNHOLM: Correct. And if it  
25 would only take twenty years, it would take somewhere in

5 2 0028

1 between there.

2 MR. MATT STAHL: Will the EPA have to  
3 enter into negotiations with the responsible parties?

4 MR. JON BORNHOLM: Following...after the  
5 Agency publishes its decision, the Agency then issues special  
6 notice letters to all of the identified potentially  
7 responsible parties to begin negotiations on the remedial  
8 design and the investigation, and that is a six month time  
9 frame that needs to be allowed. The document that hopefully  
10 comes out of that process is what we call a Consent Degree,  
11 and that is lodged in the Federal Court system. It's not  
12 really the EPA, but we ask the Federal Court to stand behind  
13 it as well. Now, if we can't come to a conclusion following  
14 the six months, we will, more likely than not, issue what we  
15 call a Unilateral Administrative Order forcing the PRPs to  
16 implement a new design, a new remedial action, and then if  
17 they refuse to do that then the superfund comes in and they  
18 are then liable for further damages, if they do not go ahead  
19 and do them themselves.

20 Are there any other  
21 questions?

22 Okay, if you have not  
23 signed on the attendance sheet, please do so on your way out  
24 so that we can have an accurate record. There are fact  
25 sheets that they sent out Friday. Hopefully you've received

5 2 0029

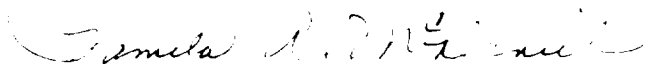
them by now. If you haven't received one, please take one on the way out. And again, there's a copy of a lot of the overheads that I used tonight. Please feel free to take one so that I don't have to carry them back to Atlanta with me. And with that, thank you.

\*\*\*\*\*

5 2 0030

C-E-R-T-I-F-I-C-A-T-E:

I, Pamela A. McDaniel, Notary Public and Court Reporter, certify that the foregoing pages constitute a true and accurate transcript, to the best of my ability, of the proceedings as taken by me stenographically on the date and at the time hereinbefore mentioned.



NOTARY PUBLIC FOR SOUTH CAROLINA

My Commission Expires: 12/18/95

RAY SWARTZ &amp; ASSOCIATES

P.O. BOX 38038 - CHARLESTON, S.C. 29414-8406  
(803) 556-2923 OR TOLL FREE IN U.S.A. 1-800-822-8711

5 2 0031

**ATTACHMENT B - HANDOUT MATERIALS**

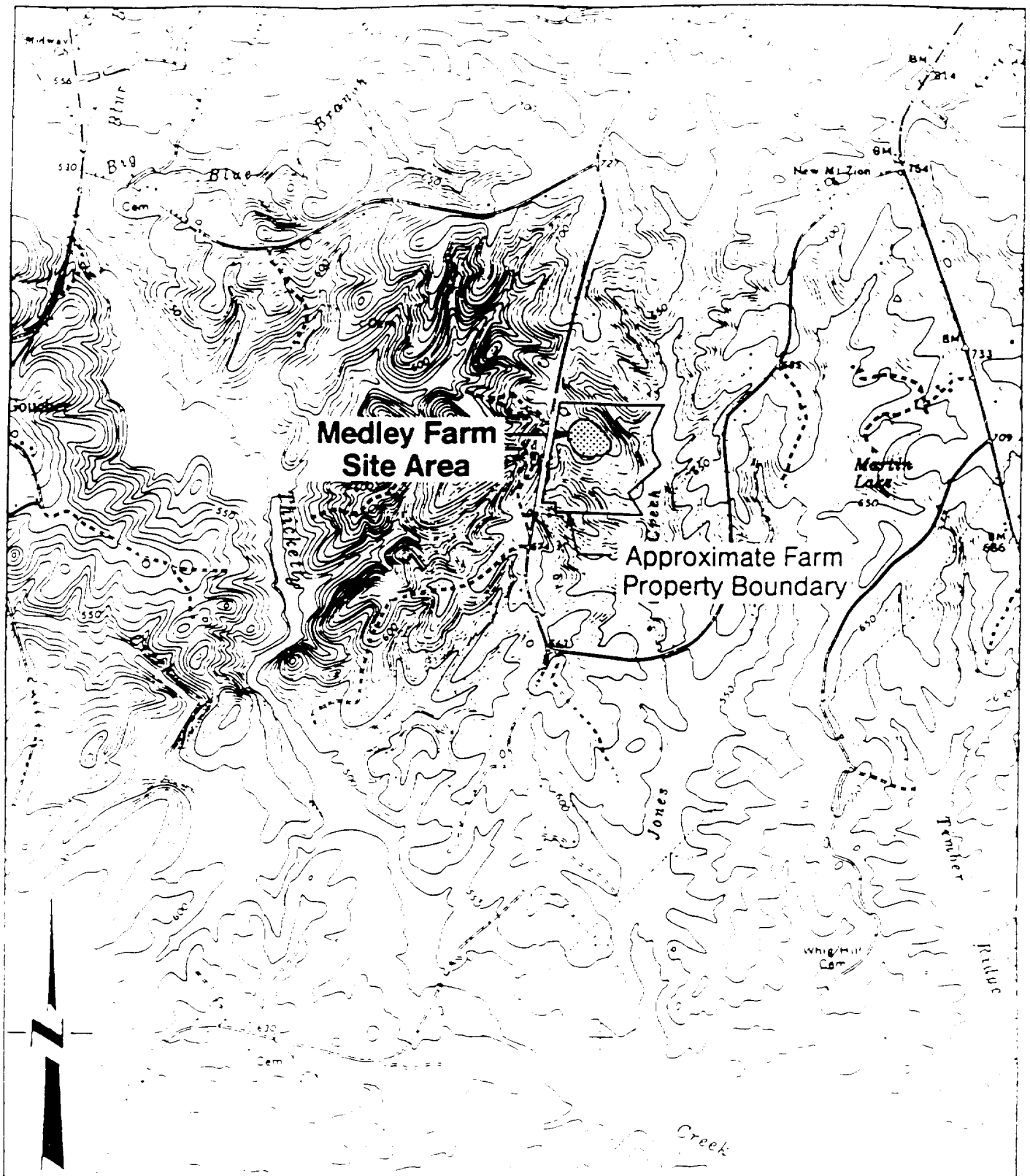
**WELCOME TO THE  
MEDLEY FARM SUPERFUND SITE  
PROPOSED PLAN PUBLIC MEETING**



**TUESDAY, FEBRUARY 12, 1991**

**7:00 PM**



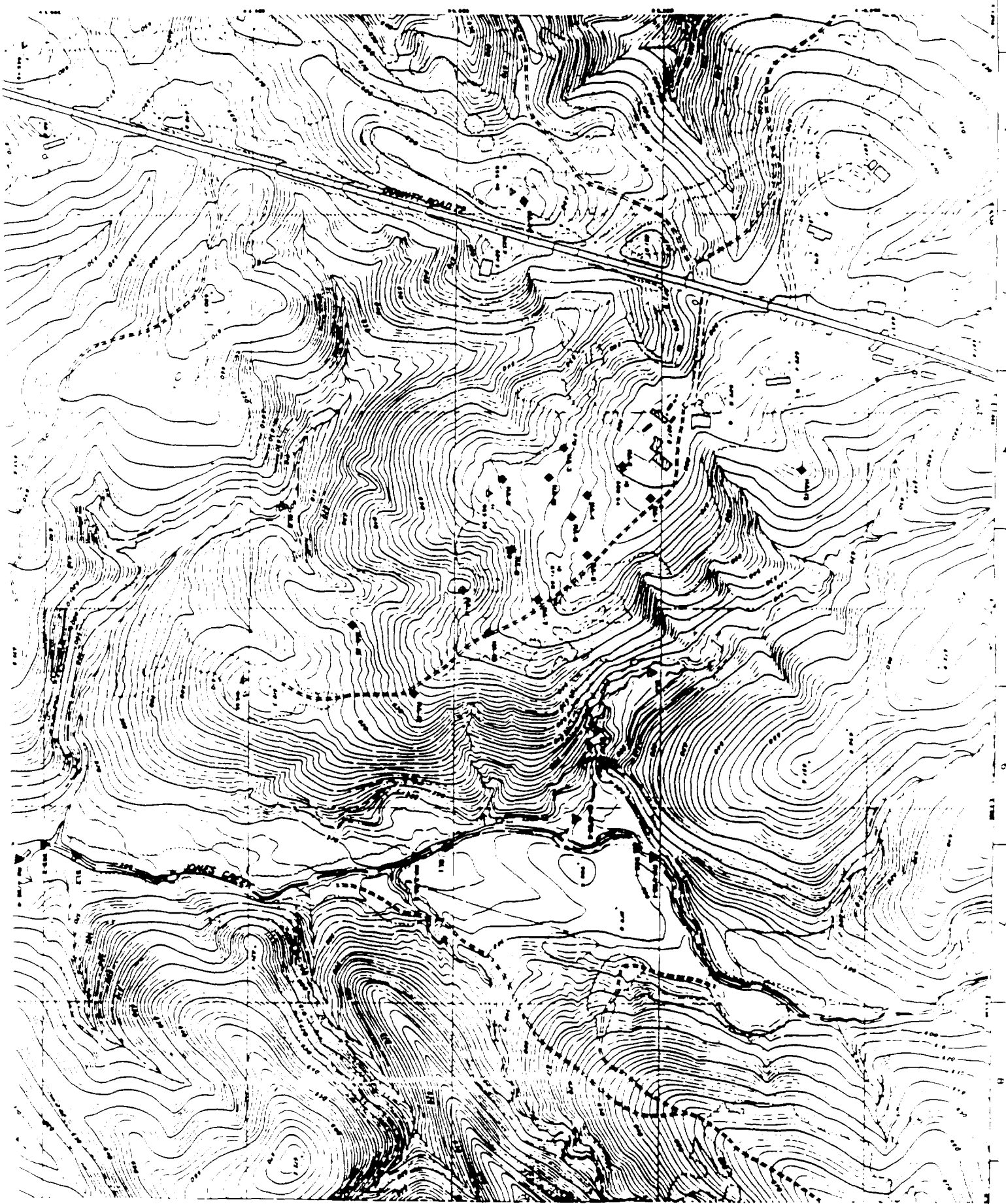


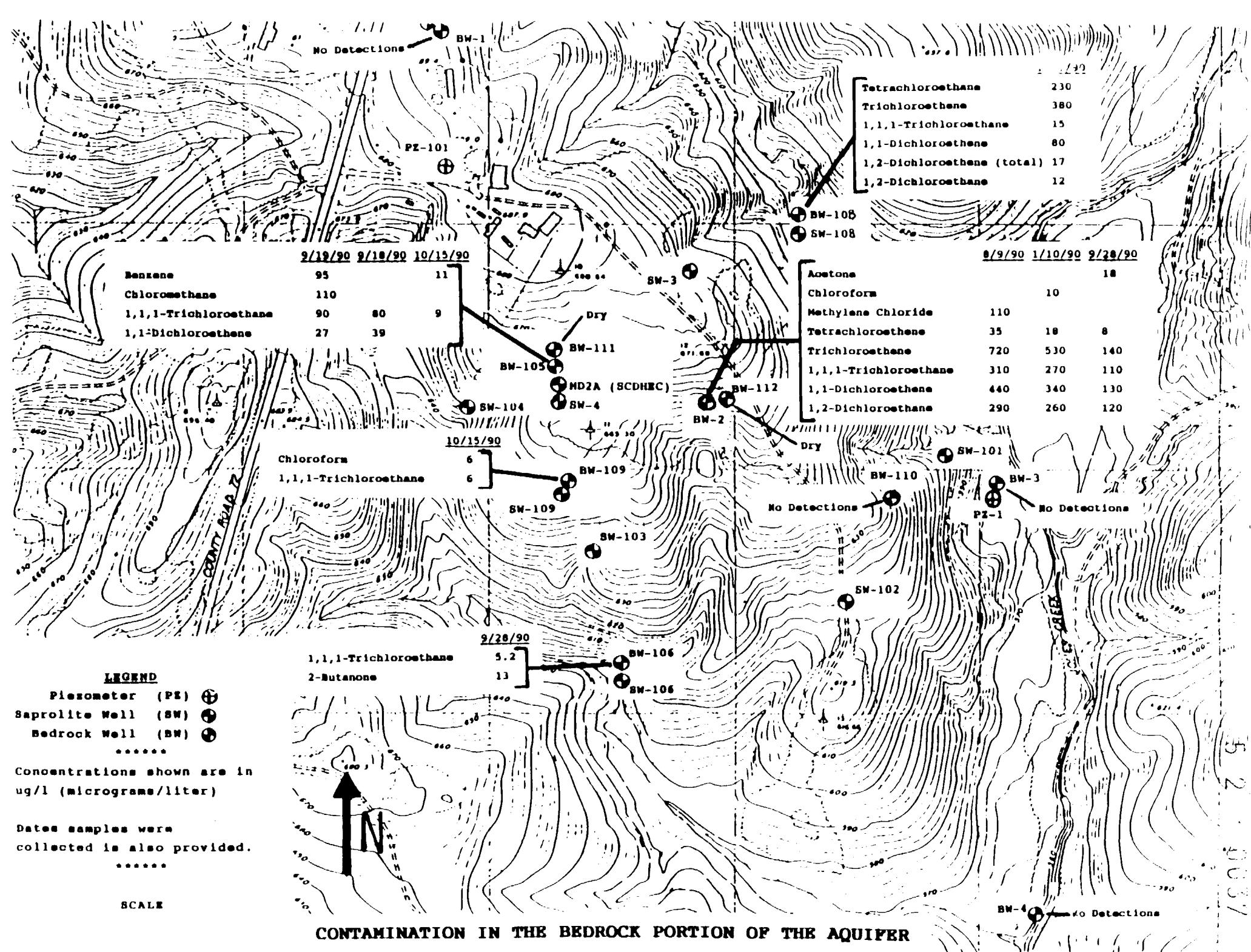
act Planning + Related Info Deleted

Name	Start Date	End Date	90 91												92												
			Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
IFS SUMMARY	3-Aug-90	25-May-91	#####																								
RI REPORT	3-Aug-90	26-Mar-91	#####																								
Draft RI Report	3-Aug-90	30-Nov-90	x																								
Review Draft RI Report	1-Dec-90	22-Jan-91	xxxxxxx																								
Revise RI Report	23-Jan-91	15-Feb-91			XXXX																						
Review Revised RI Report	16-Feb-91	17-Mar-91				XXXXXX																					
Approve Final RI Report	27-Mar-91	27-Mar-91					M																				
FS REPORT	3-Sep-90	25-May-91	#####																								
Draft FS Report	3-Sep-90	31-Dec-90	xxxxxxx																								
Review Draft FS Report	1-Jan-91	5-Feb-91		xxxxxxx																							
Revise FS Report	6-Feb-91	26-Feb-91			XXXX																						
Review Revised FS Report	8-Mar-91	14-Mar-91				XX																					
Approve Final FS Report	29-Mar-91	29-Mar-91					M																				
RIFS Reports to AR Repository	8-Feb-91	8-Feb-91			m																						
Prepare Public Meeting Notice	29-Mar-91	11-Apr-91				XXX																					
Publish Public Meeting Notice	10-Feb-91	10-Feb-91			m																						
Prepare Prop. Plan Fact Sheet	26-Jan-91	8-Feb-91		xxx																							
Prop. Plan Fact Sheet Issued	8-Feb-91	8-Feb-91			m																						
Public Comment Period	13-Feb-91	14-Mar-91				XXXXX																					
Public Meeting	12-Feb-91	12-Feb-91			m																						
End of Public Comment Period	15-Mar-91	15-Mar-91				M																					
Responsiveness Summary	15-Mar-91	21-Mar-91				XX																					
Draft Record of Decision	21-Jan-91	21-Mar-91		XXXXXXXXXX																							
EPA Review ROD	22-Mar-91	28-Mar-91				XX																					
State Concur. Letter Received	29-Mar-91	29-Mar-91				M																					
ROD Signature	27-Mar-91	27-Mar-91				M																					
ROD to Admin. Record	27-Mar-91	27-Mar-91				M																					
Close out Work Assignment	27-Mar-91	25-May-91				XXXXXXXXXX																					
REMEDIAL DESIGN SUMMARY	26-Jan-91	9-Feb-93	#####																								
RD NEGOTIATIONS	26-Jan-91	17-May-92	#####																								
Notify DOJ of Negotiations	26-Jan-91	8-Feb-91	xxx																								
Draft CD to EPA HQ, DOJ	27-Mar-91	9-Apr-91				XXX																					
RD Special Notice Ltr to PRPs	17-Apr-91	17-Apr-91				M																					
RD Moratorium	9-Jun-91	7-Aug-91						XXXXXXXXXX																			
Good Faith Offer Received	8-Aug-91	8-Aug-91							M																		
CD Negotiations	8-Aug-91	6-Oct-91							XXXXXXXXXX																		
End RD Moratorium/Sign CD	7-Oct-91	7-Oct-91								M																	
Signed CD Routed to DOJ	7-Oct-91	20-Oct-91									XXX																
CD Reviewed by DOJ	21-Oct-91	18-Mar-92										XXXXXXXXXX	XXXXXXXXXX														
CD Lodged with Court	19-Mar-92	19-Mar-92												M													
Public Comment Period	19-Mar-92	17-Apr-92												XXXXX													
Responsiveness Summary	18-Apr-92	17-May-92													XXXXX												
CD Entered by Court	18-May-92	18-May-92														M											
PROJECT PLANNING	8-Aug-91	15-May-92																									
COMMUNITY RELATIONS	8-Aug-91	1-Dec-91																									
REMEDIAL DESIGN	16-May-92	9-Feb-93																									
Draft 30% Design	16-May-92	12-Sep-92																									
30% Design Submission	13-Sep-92	13-Sep-92																									
Review 30% Design	13-Sep-92	12-Oct-92																									
Draft 60% Design	13-Sep-92	12-Oct-92																									
60% Design Submission	13-Oct-92	13-Oct-92																									
Review 60% Design	13-Oct-92	11-Nov-92																									
Draft 90% Design	13-Oct-92	11-Nov-92																									
90% Design Submission	12-Nov-92	12-Nov-92																									
Review 90% Design	12-Nov-92	11-Dec-92																									
Draft Final Design	12-Dec-92	10-Jan-93																									
Final Design Submission	11-Jan-93	11-Jan-93																									
Review Final Design	11-Jan-93	9-Feb-93																									

## REMEDIAL INVESTIGATION FINDINGS

- SOILS IN THE IMMEDIATE VICINITY OF DISPOSAL AREAS ARE CONTAMINATED WITH VOCs AND SVOCs
- GROUNDWATER IN BOTH THE SAPROLITE AND BEDROCK BENEATH AND DOWNGRAIENT OF THE SITE ARE CONTAMINATED WITH VOCs
- INORGANICS (METALS) DO NOT POSE A RISK
- GROUNDWATER IS MOVING IN A SOUTHEASTERLY DIRECTION AND THE SPROUSE WELL IS HYDRAULICALLY UPGRADIENT OF THE SITE
- NO CONTAMINANTS HAVE BEEN DETECTED IN JONES CREEK





CHEMICALS DETECTED IN SURFACE SOIL  
MEDLEY FARM SITE

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0038

Chemical	Frequency of Detection	Range of Detected Concentrations (ug/kg) <sup>(c)</sup>
<u>Volatile Organic Compounds<sup>(a)</sup></u>		
*1,1,2-Trichloroethane	2/13	110-160
*1,1,2,2-Tetrachloroethane	2/13	85-91
*1,2-Dichloroethene (total)	6/13	4-200
*1,2-Dichloropropane	1/13	21
Chlorobenzene	1/13	3
Chloroform	1/13	3
*Ethylbenzene	2/13	7-33
*Methylene Chloride	11/13	2-23
*Styrene	2/13	3-11
*Tetrachloroethene	4/13	5-69
Toluene	1/13	1
*Trichloroethene	4/13	7-70
*Vinyl Chloride	4/13	25-210
<u>Semi-Volatile Organic Compounds<sup>(b)</sup></u>		
1,2-Dichlorobenzene	2/15	190-200
*1,2,4-Trichlorobenzene	4/15	810-1200
2-Methylnaphthalene	2/15	140-160
*Butylbenzylphthalate	5/15	140-1100
*Di-n-butylphthalate	4/15	78-1100
*Di-n-octylphthalate	4/15	3600-5400
Diethylphthalate	1/15	110
*bis(2-Ethylhexyl)phthalate	6/15	82-33,000
<u>Pesticides/PCB</u>		
*Toxaphene	2/13	330-520 <sup>(d)</sup>
*PCB-1254	3/13	200-1900

\* Chemical of potential concern

<sup>(a)</sup>Volatile organic compounds and pesticides/PCB are based on data from the following samples: HA-1 thru HA-12, and HA-6-A.

<sup>(b)</sup>Semi-volatile organic compounds are based on data from the following samples: HA-1 thru HA-12, HA-6-A, HA-16, and HA-16-A.

<sup>(c)</sup>The range of detected concentrations include estimated results (chemical concentrations less than the contract-required quantitation limit).

<sup>(d)</sup>Duplicate samples taken at same location.

CHEMICALS DETECTED IN GROUND WATER BEDROCK WELLS  
MEDLEY FARM SITE

Chemical	Frequency of Detection	Range of Detected Concentrations (ug/l) <sup>(a)</sup>
<u>Volatile Organic Compounds</u>		
*1,1-Dichloroethene	6/15	2.2-440
1,1-Dichloroethane	2/15	2-3
*1,1,1-Trichloroethane	9/15	4-310
*1,1,2-Trichloroethane	1/15	3
*1,2-Dichloroethane	5/15	12-290
1,2-Dichloroethene (total)	2/15	2-17
*2-Butanone	4/15	6.8-13
*Acetone	3/15	1-18
*Benzene	1/15	11
Carbon Disulfide	1/15	4
Chlorobenzene	1/15	1
*Chloroform	6/15	4-7
Chloromethane	1/15	2
*Methylene Chloride	3/15	48-110
*Tetrachloroethene	5/15	8-230
Toluene	2/15	3-5
*Trichloroethene	5/15	140-720

Semi-Volatile Organic Compounds

None detected

\* Chemical of potential concern

<sup>(a)</sup>Detected concentrations include estimated results (chemical concentrations less than the contract-required quantitation limit).

## **FINDINGS OF THE RISK ASSESSMENT (BASELINE CONDITIONS)**

- **NO PRESENT SIGNIFICANT CARCINOGENIC RISK DUE TO EXPOSURE TO SITE-RELATED CHEMICALS AT THE SITE THROUGH ANY OF THE ENVIRONMENTAL MEDIA**
- **PRELIMINARY ASSESSMENT SHOWS THERE IS NO POTENTIAL FOR SIGNIFICANT RISK TO WILDLIFE POPULATIONS**
- **PRPs NEED TO RE-EVALUATE THE FUTURE RISK SCENARIO FOR HUMAN CONSUMPTION OF CONTAMINATED GROUNDWATER**



## OVERVIEW OF THE FEASIBILITY STUDY

### POTENTIAL GROUNDWATER REMEDIATION TECHNOLOGIES

#### NO ACTION (NATURAL ATTENUATION)

#### GROUNDWATER RECOVERY

EXTRACTION WELLS

SUBSURFACE DRAIN AND INTERCEPTION TRENCHES

ALTERNATIVE CONCENTRATION LIMITS

#### TREATMENT OF GROUNDWATER

AIR STRIPPING

GRANULAR ACTIVATED CARBON

CHEMICAL OXIDATION (UV-OZONE)

BIOLOGICAL TREATMENT

LAND TREATMENT

#### DISCHARGE OF EXTRACTED GROUNDWATER

SURFACE WATER DISCHARGE

GAFFNEY PUBLICLY OWNED TREATMENT WORKS

HORIZONTAL IRRIGATION

INJECTION WELLS

# GROUND WATER CONTROL TECHNOLOGY SUMMARY

## TECHNOLOGY

## STATUS

## REASON

### GROUNDWATER RECOVERY

EXTRACTION WELLS  
SUBSURFACE DRAINS/  
INTERCEPTION TRENCHES  
ACLs  
NO ACTION

RETAINED

REJECTED  
REJECTED  
RETAINED

CANNOT BE INSTALLED AT DEPTH IN BEDROCK  
SITE CONDITIONS NOT APPROPRIATE

### GROUNDWATER TREATMENT

ACTIVATED CARBON ADSORPTION  
CHEMICAL OXIDATION  
BIOLOGICAL SYSTEM  
AIR STRIPPING  
LAND APPLICATION

RETAINED  
RETAINED  
REJECTED  
RETAINED  
REJECTED

CHLORINATED VOCs RESISTANT TO BIODEGRADATION  
RESISTANT COMPOUNDS, SEASONAL USE

### GROUNDWATER DISCHARGE

SURFACE WATER (JONES CREEK)  
GAFFNEY POTW  
INFILTRATION GALLERY  
INJECTION WELL

RETAINED  
REJECTED  
RETAINED  
RETAINED

DISTANCE TO SERVICE  
PROVISIONALLY DEPENDING ON APPLICATION RATES  
PROVISIONALLY DEPENDING ON APPLICATION RATES

## POTENTIAL REMEDIAL ALTERNATIVES

### ALTERNATIVE

### DESCRIPTION

#### GROUNDWATER CONTROL

GWC-1	NO ACTION
A	NO ADDITIONAL ACTIVITIES
B	INSTITUTE LONG-TERM GROUNDWATER MONITORING
GWC-2	RECOVERY OF ALL GROUNDWATER ABOVE MAXIMUM CONCENTRATION LEVELS
A	TREATMENT USING AIR STRIPPING
B	TREATMENT USING CARBON ADSORPTION
C	TREATMENT USING CHEMICAL OXIDATION
GWC-3	RECOVERY OF ALL GROUNDWATER THAT COULD EXCEED MCLs AT THE PROPERTY LINE
A	TREATMENT USING AIR STRIPPING
B	TREATMENT USING CARBON ADSORPTION
C	TREATMENT USING CHEMICAL OXIDATION

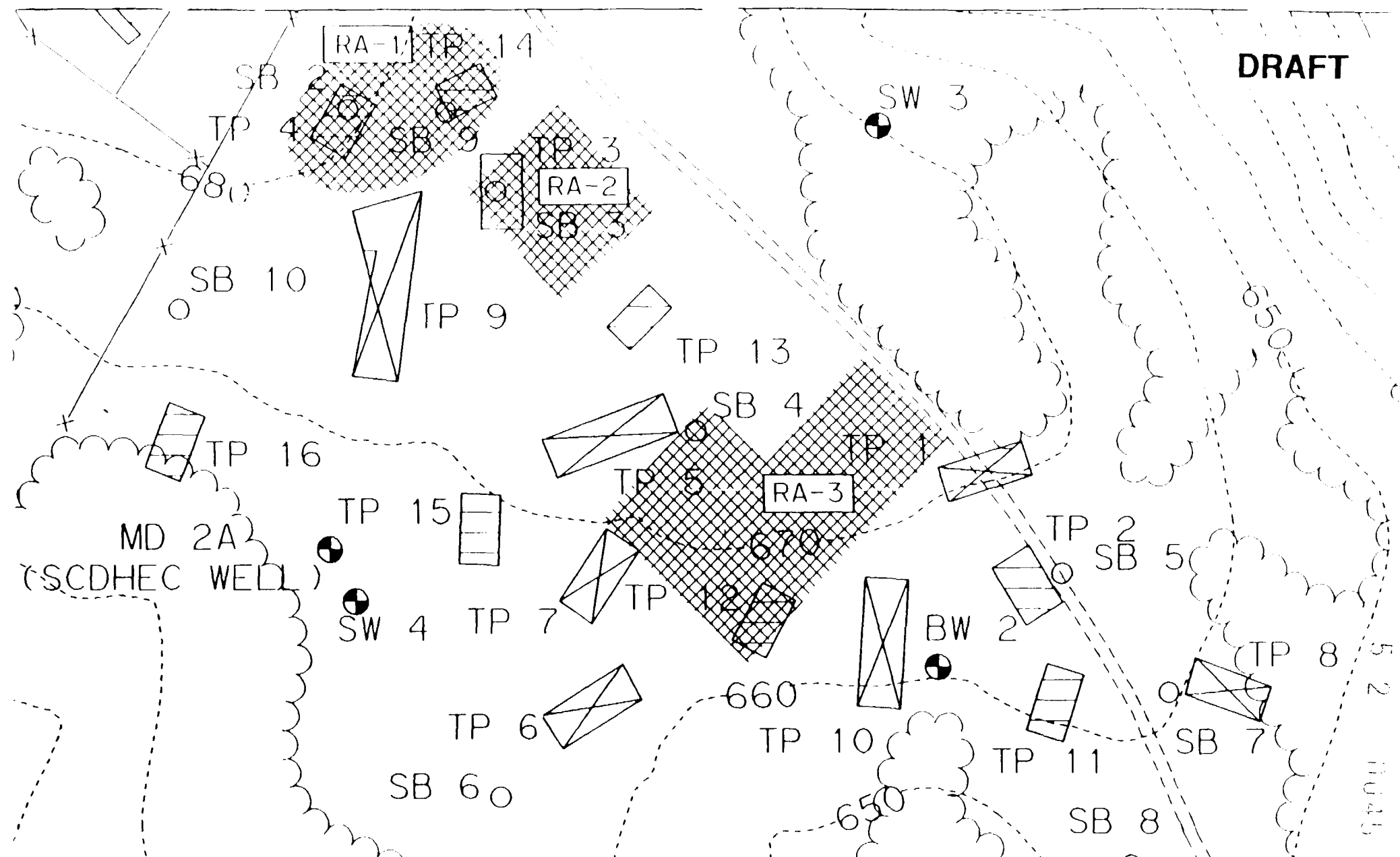
#### SOURCE CONTROL

SC-1	NO ACTION
SC-2	CAPPING SOURCE AREA
SC-3	SOIL VAPOR EXTRACTION IN AREAS EXCEEDING CALCULATED

## RETAINED ALTERNATIVES FOR DETAILED ANALYSIS

<u>ALTERNATIVE</u>	<u>DESCRIPTION</u>	<u>PRESENT WORTH COSTS</u>
GWC-1A	NO ACTION FOR GROUNDWATER	\$100,000
GWC-1B	NO ACTION; LONG-TERM MONITORING	\$440,000
GWC-2A	MCLs ACROSS SITE; AIR STRIPPING	\$1,600,000
GWC-3A	MCLs AT PROPERTY LINE; AIR STRIPPING	\$1,300,000
SC-1	NO ACTION FOR SOURCE CONTROL	\$100,000
SC-2	CAP SOURCE AREA	\$810,000
SC-3	SOIL VAPOR EXTRACTION	\$620,000

**DRAFT**



Greenville, South Carolina

FIGURE 4.2  
APPROXIMATE EXTENT OF  
SOURCE AREAS EXCEEDING  
CALCULATED SOIL REMEDIATION  
LEVELS  
MEDLEY FARM SITE

FOR FURTHER INFORMATION ABOUT THIS SITE

Mr. Jon K. Bornholm  
Remedial Project Manager  
U.S. Environmental  
Protection Agency —  
Region IV  
345 Courtland Street, NE  
Atlanta, Georgia 30365  
(404) 347-7791

Mr. Richard Haynes  
State of South Carolina  
Department Health and  
Environmental Control  
2600 Bull Street  
Columbia, South Carolina 29201  
(803) 734-5200

Mr. Chuck Pietrosewicz  
Agency of Toxic Substances &  
Disease Registry Liaison  
U.S. Environmental  
Protection Agency  
Region IV  
345 Courtland Street, NE  
Atlanta, Georgia 30365  
(404) 347-1586

Mr. Keith Lindler  
State of South Carolina  
Department Health and  
Environmental Control  
2600 Bull Street  
Columbia, South Carolina 29201  
(803) 734-5200

Ms. Denise Bland  
Technical Assistance  
Grants Coordinator  
U.S. Environmental  
Protection Agency  
Region IV  
345 Courtland Street, NE  
Atlanta, Georgia 30365  
(404) 347-2234

Mr. Thom Berry  
Director, Division of  
Media Relations  
State of South Carolina  
Department Health and  
Environmental Control  
2600 Bull Street  
Columbia, South Carolina 29201  
(803) 734-5038

Ms. Cynthia Peurifoy  
Community Relations  
Coordinator  
U.S. Environmental  
Protection Agency  
Region IV  
345 Courtland Street, NE  
Atlanta, Georgia 30365  
(404) 347-7791

5 2 0047

ATTACHMENT C - ATTENDANCE LIST

## APPENDIX C: LIST OF MEETING ATTENDEES

<u>Name</u>	<u>Address</u>
Greg Blanstt	SCDHEC, Div. of Health and Hazard Evaluation Columbia, SC 29201
Edy Sissaman	Gaffney Ledger Gaffney, SC
T. Pierre	WYFF-TV 4N/A
T. Valerio	National Starch and Chemical Co. 10 Finnerne Avenue Bridgewater, NJ 08807
Jim Chamness	Sirrine Environmental P.O. Box 24 Greenville, SC 29687
Fred Spence	Gaffney, SCN/A
Phil Sarata	WAGI-FM Gaffney, SC 29340
Matt Stahl	Spartanburg Herald-Journal 313 1/2 N. Limestone St. Gaffney, SC 29240
Scott T. Peeler	
Jimmie G. Peeler	
Ed Gregory	SCDHEC, Div. of Health and Hazard Evaluation Columbia, SC 29201
Evelin Henderson	WSPA Radio
Mark Henderson	WSPA Radio
Angela Gorman	SCDHEC, Div. of Health and Hazard Evaluation Columbia, SC 29201
Richard Haynes	SCDHEC, Div. of Health and Hazard Evaluation Columbia, SC 29201
Vanding Mo	SCDHEC, Div. of Health and Hazard Evaluation Columbia, SC 29201

Note: None of the meeting attendees requested to be added to the mailing list.



5 2 0049

ATTACHMENT D - COPY OF PUBLIC NOTICES

**THE U.S. ENVIRONMENTAL PROTECTION AGENCY  
INVITES PUBLIC COMMENT ON  
THE ADMINISTRATIVE RECORD AND PROPOSED PLAN FOR THE  
MEDLEY FARM SUPERFUND SITE  
IN CHEROKEE COUNTY, SOUTH CAROLINA  
Tuesday, February 12, 1991 at 7:00 p.m.  
Gaffney High School Cafeteria  
(803) 489-2544**

**Public Meeting**

The U.S. Environmental Protection Agency (EPA) will hold a public meeting on Tuesday, February 12, 1991, at 7:00 p.m. in the Gaffney High School cafeteria, at 805 E. Frederick Street, Gaffney, South Carolina. The purpose of the meeting will be to discuss the Proposed Remedial Action Plan including the preferred action alternative designed to address contamination at the Medley Farm Superfund Site. Other cleanup alternatives which were evaluated in the Feasibility Study (FS) will also be reviewed. The public is encouraged to attend, ask questions, and offer comments at the meeting.

The Medley Farm Superfund Site occupies a 7-acre tract of land off Highway 72, about 6 miles south of the City of Gaffney. During the period from 1973 to 1978, textile, paint, and chemical manufacturing wastes were disposed of on the Medley Farm site. In May 1983, EPA conducted sampling at the Site and performed an emergency removal action in the following month. After negotiations with EPA, five of the potentially responsible parties (PRPs) agreed to fund and carry out the Remedial Investigation/Feasibility Study (RI/FS) for the Site. The draft RI was presented to EPA in March 1990, and the Site was placed on the National Priorities List (NPL) for a Superfund cleanup. Based on the RI findings, the EPA has reviewed nine alternatives for addressing groundwater and source contamination at the Site.

**Preferred Alternative**

The preferred alternative for cleanup involves:

- Recovery of all ground water that exceeds maximum concentration levels and treating the extracted ground water prior to discharging to Jones Creek through an air stripping tower; and
- Soil vapor extraction in areas exceeding calculated soil remediation levels. If levels of contaminants in the extracted air are above those allowed by either the Clean Air Act and/or the South Carolina Pollution Control Act, then the extracted vapors will be passed through an activated carbon unit prior to being released to the environment.

**Other Alternatives**

Other remedial alternatives under consideration include:

- No action
- Treatment of ground water using carbon absorption
- Treatment of ground water using chemical oxidation
- Treatment of ground water at property line using the same three options listed above
- Capping the source areas.

These alternatives are presented fully in the FS.

**Public Comment Period**

EPA hereby announces a 30-day public comment period, from February 13 to March 14, 1991, during which time the public is invited to review and comment on the Administrative Record, including the Proposed Plan, RI, and FS reports. Selection of the final remedy will be made after consideration of all public comments on the RI/FS and the Proposed Plan, and will be documented in the Record of Decision for the Site.

**Information Repositories**

The Administrative Record, including the Proposed Plan and RI/FS documents, is available for public review at the following location:

Cherokee Public Library  
300 E. Rutledge Street  
Gaffney, SC 29340

Hours:  
Monday & Tuesday: 10 am-6 pm  
Wednesday - Friday: 10 am-6 pm  
Saturday: 10 am-4 pm

Contact: Ms. Anna Mosley  
(803) 487-2711

**Additional Information**

If, after reviewing the Site information, you would like to comment in writing on EPA's preferred or other alternatives, or other issues relevant to the Site cleanup, please mail your written comments to:

Mr. Jon Bornholm  
Community Relations Coordinator  
U.S. Environmental Protection Agency  
Region IV  
345 Courtland Street, N.E., Atlanta, GA 30345  
(404) 347-7781

Mr. Bornholm may also be contacted for further information about the Site, or for questions regarding the public meetings or opportunities for public participation.

**CNC**

**participates**  
city equipped  
er, grills, re  
4-1-91 AM

**2040—Adult/Child Care**

Live in with elderly gentleman,  
near Simpsonville. Not bedridden.  
Call: 441-8144, 441-8145, 441-8146

**5 2 0001**

## LEGAL NOTICES

The public comment period has been extended for an additional thirty days and will end on April 13, 1991.

The Proposed Plan outlines EPA's preferred cleanup alternative for the site, as well as other cleanup alternatives that were evaluated in the Feasibility Study conducted for the site. The preferred alternative for cleanup of the site includes:

Recovery of all ground water that exceeds maximum concentration levels and treating the extracted ground water prior to discharging to Jones Creek through an air stripping tower; and

Soil vapor extraction in areas exceeding calculated soil remediation levels. If levels of contaminants in the extracted air are above those allowed by either the Clean Air Act and/or the South Carolina Pollution Control Act, the extracted vapors will be passed through an activated carbon unit prior to being released to the environment.

The Medley Farm Superfund Site occupies a seven-acre tract of land off Highway 72, about six miles south of the City of Gaffney. During the period from 1973 to 1978, textile, paint and chemical manufacturing wastes were disposed of on the Medley Farm site.

The Administrative Record, which includes the Proposed Plan and the Remedial Investigation Feasibility Study documents, is available for public review at the following location:

Cherokee Public Library  
300 E. Rutledge Street  
Gaffney, South Carolina  
(803) 487-2711

Hours:  
Monday & Tuesday, 10am-4pm  
Wednesday, 10am-4pm  
Saturday, 10am-4pm

If after reviewing the information on the site, you would like to comment in writing on EPA's preferred alternative, any of the other cleanup alternatives under consideration, or other issues relevant to the site's cleanup, please mail your comments to:

Jon Barnholm  
Remedial Project Manager  
U.S. Environmental Protection Agency  
345 Courtland Street, N.E.  
Atlanta, GA 30345  
(404) 347-7791

Written comments must be postmarked no later than April 13, 1991. Mr. Barnholm may be contacted at the number above for further information about the site. 2658354.

THE U.S. ENVIRONMENTAL PROTECTION AGENCY ANNOUNCES EXTENSION OF THE PUBLIC COMMENT PERIOD ON THE PROPOSED PLAN AND ADMINISTRATIVE RECORD FOR THE MEDLEY FARM SUPERFUND SITE IN CHEROKEE COUNTY, SOUTH CAROLINA

The U.S. Environmental Protection Agency has extended the public comment period on the Proposed Remedial Action Plan and the Administrative Record for the Medley Farm Superfund site in Cherokee County, South Carolina.

**298-4221**



Legal Notices	7B
Manufactured Housing	4
Merchandise	2
Real Estate	4
Recreation	5
Rentals	3
Services	2
Transportation	5
Yard/Garden/Farm	3

### 1030—Lost & Found

FOUND: BLACK CAT  
With no tail. Has flea collar.  
CALL 232-7474

FOUND: Cocker Spaniel, GE plant area. Call to identify 234-4638 or 244-9066 evens.

### 1030—Lost & Found

FOUND: Mixed breed black & white, short hair, friendly dog. About 1 yr. old. 859-1844.

FOUND: Orange 1 or 2 yrs. old male neutered cat in Sugar Creek St. Call 244-8547

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ATTACHMENT E - WRITTEN COMMENTS RECEIVED BY EPA

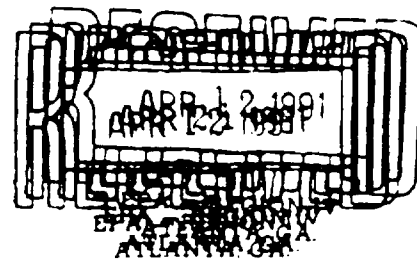
KING & SPALDING

191 PEACHTREE STREET  
ATLANTA, GEORGIA  
40303-1703

404/572-4600  
TELEX 54-2017 KINGSPALD ATL  
TELECOPIER 404/572-5100

April 12, 1991

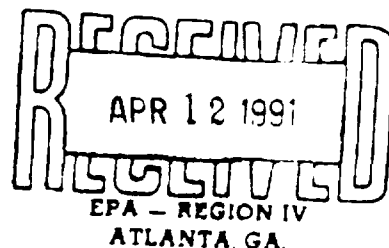
1730 PENNSYLVANIA AVENUE, NW  
WASHINGTON, DC 20006  
TELEPHONE 202/737-0500  
TELECOPIER 202/626-3737



715 FIFTH AVENUE  
NEW YORK, NY 10151  
TELEPHONE 212/758-8700  
TELECOPIER 212/593-3673

VIA HAND DELIVERY

Mr. Jon E. Bornholm  
Remedial Project Manager  
United States Environmental  
Protection Agency, Region IV  
345 Courtland Street, N.E.  
Atlanta, Georgia 30365



Re: Medley Farm Site

Dear Mr. Bornholm:

I am writing on behalf of the Medley Farm Site Steering Committee. In accordance with the National Contingency Plan, the Steering Committee hereby submits comments on the Environmental Protection Agency's ("EPA") proposed plan for remedial action at the Medley Farm Site ("the Proposed Plan").

The Proposed Plan calls for:

°recovery and treatment of groundwater that exceeds maximum contaminant levels at the Site; and

°soil vapor extraction to remove residual source contamination.

EPA has concluded that the low levels of contamination remaining in the soils at the Site pose no significant risk to human health and the environment. Nonetheless EPA has proposed that the soils be remediated through soil vapor extraction (SVE) to speed and enhance the groundwater remediation at the Site. The Steering Committee and its consultant, Sirrine Environmental Consultants, do not agree that soil remediation should be required in addition to direct groundwater remediation.

Almost all soil contamination was removed in the emergency removal action in 1983. The residual soil contamination remaining at the Site will naturally flush through and be captured by the

5 2 0034

groundwater recovery and treatment system with no significant impact on the operational life of that system. Groundwater remediation alone will result in a permanent reduction of Site contaminants. The proposed soil vapor extraction remedy would, therefore, add to the cost of remediation at the Site without appreciably reducing the potential risks posed by the Site or the length of time for full remediation to eliminate those potential risks.

The Steering Committee believes that soil vapor extraction should be eliminated from the plan for remedial action. We propose that EPA instead select natural flushing combined with groundwater recovery and treatment as the remedy for the Site. The effectiveness of this remedy will be reviewed after five years of implementation. The impact of natural flushing on the groundwater remediation can be evaluated more effectively at that time. At this point, the estimated impact is not significant enough to require a source control remedy such as soil vapor extraction.

The Steering Committee's position and alternative proposal are discussed more fully in the attached comments. The Steering Committee and Sirrine are available to answer any questions you might have.

Sincerely,

  
Mary Jane Norville

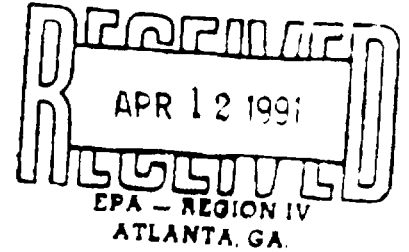
MJN:lw b

Attachment

cc: Elaine Levine (w/attachment)  
Keith Lindler (w/attachment)  
Jim Cloonan (w/attachment)  
Jim Chamness (w/attachment)  
Medley Farm Site Steering Committee (w/attachment)

5 2 0055

COMMENTS ON PROPOSED PLAN  
FOR REMEDIAL ACTION AT THE  
MEDLEY FARM SITE



APRIL 12, 1991

SUBMITTED

BY

THE MEDLEY FARM SITE STEERING COMMITTEE

BACKGROUND

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The U.S. Environmental Protection Agency (EPA) released a proposed plan for remediation of the Medley Farm Site ("Site") in Gaffney, South Carolina on February 7, 1991. The preferred remedy involves:

Treatment Using Air Stripping: Recovery of all ground water above maximum contaminant levels ("MCLs") and treating the extracted ground water prior to discharging to Jones Creek through an air stripping tower (Alternative GWC-2A); and

Soil Vapor Extraction: Soil vapor extraction in areas exceeding calculated soil remediation levels. If necessary to comply with applicable portions of the Clean Air Act and the South Carolina Pollution Control Act, the extracted vapors will be controlled using an activated carbon unit (Alternative SC-3).

The Medley Farm Site Steering Committee ("the Steering Committee") represents the parties who agreed under an Administrative Order by Consent to perform the Remedial Investigation/Feasibility Study ("RI/FS") for the Site. Sirrine Environmental Consultants ("Sirrine") served as the Steering Committee's consultant for performance of the RI/FS. The Steering Committee and Sirrine have reviewed the proposed plan. The Steering Committee hereby submits comments on the plan and requests consideration of changes in the plan based on these comments.



Specifically, the Steering Committee and Sirrine believe that active remediation of Site soils is not necessary or cost-effective. The rationale for their disagreement with the proposed plan and a proposed alternative are set forth below.

OBJECTION TO REMEDY: NECESSITY OF SOURCE CONTROL

The great majority of chemical residuals at the Site were removed during the immediate removal action in 1983. Remaining contaminants in soils consist of low levels (generally less than 1 mg/kg) of primarily volatile organic compounds (VOCs). The baseline risk assessment determined that Site soils do not pose a significant risk to human health or the environment through a direct pathway.

The only risk posed by Site soils is the indirect risk that occurs through the leaching of VOCs from certain areas of soils into groundwater. As rainwater infiltrates the soils, the VOCs are naturally flushed in the groundwater (Alternative SC-1). VOCs in groundwater can then be recovered using extraction wells and treated (Alternative GWC-2A). Consequently, when the groundwater extraction system is operational, site soils will no longer pose a risk to potential receptors either directly or indirectly.

Remediation of Site soils is not necessary to protect human health or the environment from direct or indirect risks. All Site soils are less than the TSCA remediation level of 10 mg/kg for PCBs, the

only identified ARAR for Site soils. Therefore, remediation of Site soils is not necessary for compliance with ARARs. Natural flushing (Alternative SC-1) satisfies the threshold criteria given by the National Contingency Plan ("NCP") for Protection of Human Health and the Environment and Compliance with ARARs. Natural flushing is therefore a protective alternative that is eligible for selection as a source control remedy.

Once the threshold criteria are satisfied, selection of a source control remedy must be determined from among the NCP's primary balancing criteria. Although the removal of VOCs from Site soils might be accelerated through soil vapor extraction (SVE; Alternative SC-3), the efficacy of SVE depends on whether it would decrease the time required for overall (soils and groundwater) Site remediation and therefore be cost effective as compared to pump-and-treat alone (i.e., natural flushing).

The primary balancing criteria are:

- ° long-term effectiveness and permanence
- ° reduction of toxicity, mobility and volume
- ° short-term effectiveness
- ° implementability
- ° cost

Evaluation of source control measures must be considered in the context of the overall Site remedy, including groundwater extraction and treatment. In this perspective, natural flushing

rates favorably within the balancing criteria. Natural flushing would effect a permanent reduction in the volume of VOCs in soils. These VOCs would then be recovered by the groundwater extraction system and treated, resulting in a net reduction in the toxicity and volume of Site VOCs. Natural flushing can be readily implemented and would pose no risks to the community or the environment during implementation. As discussed below, natural flushing is more cost effective than soil vapor extraction (Alternative SC-3). Alternative SC-1 therefore achieves the best aggregate agreement with the primary balancing criteria from among the source control alternatives.

ESTIMATED DURATION OF GROUNDWATER EXTRACTION: CASE HISTORIES

Given that soils do not pose a significant risk at the Site, the only reason for source control is if it would accelerate the overall remediation of the Site. The Committee and Sirrine do not believe that a source measure, such as SVE, will effect a significant reduction in the time required to achieve remediation levels in groundwater.

A number of recent EPA publications describing actual groundwater remediation experiences indicate that remediation levels would not be achieved long after theoretical models had predicted site restoration. A sampling of EPA documents describing the protracted periods for groundwater remediation include:

- ° U.S. EPA Evaluation of Groundwater Extraction Remedies. Office of Solid Waste and Emergency Response; EPA/504/0289/054; Washington, DC, 1989.
- ° U.S. EPA. 1989. Consideration in Ground Water Remediation at Superfund Sites. Memorandum from Jonathan Cannon to EPA Regional Offices, Directive No. 9355-4-03, Office of Solid Waste and Emergency Response 1989.
- ° U.S. EPA. 1990. Evaluation of Ground Water Extraction Remedies, v. 2, Case Studies, EPA/540/2-89/054.
- ° U.S. EPA. 1989. Ground Water Issue, Performance Evaluation of Pump-and-treat Remediations. Office of Research and Development.
- ° Hall, C.W., "Limiting Factors in Ground Water Remediation", 20th Annual Conference on Environmental Law, March 1991, Keystone, Co. [NOTE: C.W. Hall is Director of EPA's Robert S. Kerr Environmental Research Laboratory.]

A review of EPA and other technical publications on groundwater remediation has concluded that restoration to MCLs is "currently unachievable" (Travis and Doty, 1990). The review determined that not "a single aquifer in the United States has been confirmed to be successfully restored through pumping and treating." A separate review article co-authored by EPA personnel (Haley, et al, 1991) identified the following impediments to achieving MCLs in relatively short time frames:

- ° sorption of contaminants to saturated soils
- ° aquifer properties, such as subsurface heterogeneity and fractures
- ° exceedingly low remediation levels
- ° presence of "stagnation zones" within the groundwater extraction system.

All of these conditions are applicable to the Site. VOCs at the Site have significant organic carbon/water partitioning coefficients, indicating a tendency to sorb to soils. The geology consists of a low conductivity saprolite, a higher conductivity transition zone, and fractured bedrock. Experience at other sites indicates that this heterogeneity will likely protract the time required for aquifer restoration due to differing contaminant desorption rates and discontinuities in hydraulic flow patterns. The collective effect of these factors is to all but guarantee that groundwater remediation at the Site may not achieve MCLs for decades since MCLs at the Site are generally at the low parts per billion range. While groundwater recovery and treatment will reduce contaminant levels significantly (90+%), MCLs will likely not be achieved in predictable time frames with or without source control.

Both review articles (Travis and Doty; Haley, et. al.) indicated that:

- ° plume containment and mass reduction should be primary objectives of groundwater remediation and

- ° that restoration of a heterogeneous aquifer to MCLs is not likely.

Numerous EPA documents based on a variety of case histories confirm the technical realization that groundwater remediation is apt to be a containment action that prevents migration. Since MCLs are not likely to be achieved with or without source control in a predictable period of time, and since soils without treatment present no direct risks to human health, the Steering Committee questions the need for active source control measures at the Site. Existing volatile organic compound (VOC) levels in groundwater are evidence that natural flushing is occurring. Contaminants will, therefore, be recovered and treated by the groundwater remediation system. The proposed groundwater remediation system, with or without source control, will reduce contaminant levels significantly. In addition, contaminants will also be contained from migrating beyond Site boundaries and prevent any future risks to potential downgradient receptors. A source control remedy is therefore not required for the remediation of Site soils.

#### OBJECTION TO REMEDY: COST-EFFECTIVENESS

The cost-effectiveness of SVE can best be evaluated by comparing its present worth costs with the additional groundwater remediation costs associated with natural flushing. Unsaturated transport modeling can be used to predict the time required for natural flushing to remediate Site soils. A batch flushing model can be used to estimate the groundwater remediation period

following SVE and natural flushing. The difference in remediation periods represents the additional groundwater remediation costs that SVE must be compared against.

Existing Groundwater: A batch flushing model (EPA, 1988) was used to estimate the time required to achieve MCLs under current groundwater conditions. Based on a 99.8 percent reduction of total VOCs in groundwater, remediation of Site groundwater is projected to take approximately 10 years assuming no flushing of additional contaminants into the groundwater. This time estimate is almost certainly low, as evidenced by the previous discussion regarding case histories and Site characteristics. A protracted groundwater extraction period would reduce any time and cost savings associated with SVE.

Soil Vapor Extraction: Remediation of Site soils to the remediation levels given in the FS (Table 4.3) would require approximately one year. SVE would be conducted concurrently with groundwater extraction.

Natural Flushing: Based on maximum site concentrations, adsorption to soils, and MCL value, trichlorethene (TCE) would determine the duration of natural flushing. The leaching potential of TCE can be estimated using the unsaturated transport model presented in the FS (Appendix E). Based on maximum soil concentrations at the Site, TCE is projected to impact groundwater above MCLs for approximately 20 years (see attached table).

Therefore, the time estimate projected for groundwater remediation assuming natural flushing with no SVE would be approximately 20 years.

Final Groundwater Extraction with Natural Flushing: Groundwater extraction would be required following completion of natural flushing to remove residual levels of VOCs. VOC levels after 20 years would be approximately at MCL levels (attached table), considerably lower than for current conditions. It is assumed that a 50 percent reduction in VOCs would be required following the completion of natural flushing to obtain MCLs. Using the batch flushing model, the additional groundwater extraction to achieve the 50 percent reduction would require approximately one year.

Final Groundwater Extraction with SVE: SVE is estimated to be completed within one year. Groundwater remediation under current conditions assuming no flushing of additional contaminants into groundwater has been estimated to take 10 years. VOC levels remaining after SVE could not impact groundwater above MCLs. No further groundwater extraction past 10 years would be anticipated if the remediation is accomplished as predicted by the batch-flushing model. Based on the lingering effects of residual VOC levels in groundwater, the extraction period of 10 years is likely an underestimate.



Summary: Natural flushing is projected to result in approximately 11 more years of groundwater extraction than if SVE were conducted. Since the model predicts that a minimum of 10 years of groundwater extraction would be required to achieve MCLs based on current groundwater conditions, the costs for additional groundwater extraction required to address further leaching would not begin until year 10. Experience with groundwater remediation at Superfund sites indicates that groundwater extraction and treatment under current conditions will not likely achieve MCLs within the 10 years projected by the model. The difference in groundwater extraction periods between SVE and natural flushing is therefore likely to be an overestimate.

#### COST EVALUATION

The total present worth costs (PWC) for SVE (Alternative SC-3) and annual groundwater remediation (Alternative GWC-2A) were estimated in the FS to be:

- ° SVE: \$620,000
- ° Annual groundwater remediation costs: \$81,000

The present worth costs for SVE must be compared with the present worth costs for the annualized series of groundwater remediation costs for the additional 11 years of operation. Calculation of the present worth costs for the additional groundwater remediation is a two step process:

- ° Convert the annual series to one cost at year 10.

° Convert the cost at year 10 to a present worth basis (year 0).

Present worth costs are evaluated at a discount rate of 5 percent, per EPA guidance. The calculation for the additional 11 years of groundwater remediation is:

$$\begin{aligned}\text{Groundwater remediation PWC} &= \$81,000 (P/A, 11, 5\%)(PF, 10, 5\%) \\ &= \$81,000 (8.306)(0.6139) \\ &= \$410,000\end{aligned}$$

#### COST EFFECTIVENESS DETERMINATION

The present worth costs for soil vapor extraction would be approximately \$620,000. The present worth costs to conduct an additional 11 years of groundwater remediation 10 years in the future, as required for natural flushing, would be approximately \$410,000. Natural flushing (Alternative SC-1) is therefore a more cost effective source control remedy for the Medley Farm Site than soil vapor extraction (Alternative SC-3). The estimated difference in present worth costs of approximately \$210,000 is almost certainly low since groundwater extraction at the Site will likely require more than the estimated 10 years to achieve MCLs with SVE.

Modeling predicts that aquifer restoration would require approximately 21 years through natural flushing and groundwater extraction. Both Site soils and groundwater would be at remediation levels at this time, thereby satisfying SARA's preference for a permanent remedy. The estimate of 10 years for aquifer restoration through SVE and groundwater extraction is

likely optimistic in light of EPA's evaluation of other groundwater remediation projects. The net result is that the apparent difference of 11 years for aquifer restoration through SVE is almost certainly overestimated and the difference in remedial time frames will be less. Any reduction in the differential time for remediation would increase the cost-effectiveness of natural flushing (Alternative SC-1).

OBJECTION TO REMEDY: CONCLUSIONS

- ° Direct remediation of Site soils (source control) is not required because site soils do not pose a significant risk to human health or the environment.
- ° The evaluation of groundwater remediation projects by EPA and independent authorities indicates that projections of aquifer restoration periods are greatly underestimated.
- ° Site conditions are consistent with aquifer and contaminant characteristics that are likely to prolong aquifer restoration.
- ° Natural flushing (Alternative SC-1) has estimated present worth costs that are approximately \$210,000 less than for SVE (Alternative SC-3). Because groundwater models tend to underestimate the time for aquifer restoration, the difference in costs is likely to be significantly higher.

- ° Active source control is not warranted for the Site based on risk, technical, or cost considerations.
- ° Groundwater extraction alone can prevent potential future risks, is technically justifiable based on EPA experience, and in conjunction with natural flushing is the most cost-effective remedy for the Site.

#### PROPOSED ALTERNATIVE

Knowledge of contaminant transport at the Site is based on two sampling events conducted under passive conditions (no remediation) and overly optimistic groundwater models. The Steering Committee proposes that a remedy involving natural flushing (Alternative SC-1) and groundwater control (Alternative GWC-2A) be initiated at the Site. The effects of leaching from soils and groundwater extraction can be evaluated at the 5-year review of remedy using results from regular monitoring events. Projections of the impact of soils on groundwater quality and aquifer restoration time frames can be conducted more effectively at that time. Should the results indicate a significant impact from soils and potential for achieving MCLs in groundwater, a pilot-test for SVE could be conducted to assess its site-specific effectiveness. Full-scale SVE could be implemented once the effectiveness was demonstrated and design parameters were established. This approach would be based on site-specific data and would allow the most demonstrated approach for selection of remedy. Since Site contaminants have been flushing into

groundwater for approximately 18 years, a review period of five years should have no appreciable effect on Site conditions (any variations in groundwater quality would be controlled by the extraction system). The absence of any risks to human health further validates the appropriateness of this approach.

#### REFERENCES

EPA, Guidance on Remedial Actions for Groundwater at Superfund Sites, EPA/540/G-88/003, Washington, DC, December 1988.

EPA, "Evaluation of Groundwater Extraction Remedies", EPA/504/0289/054, Washington, DC, 1989.

Haley, J.L. et al, "Evaluating the Effectiveness of Ground Water Extraction Systems", Ground Water Monitoring Review, Winter 1991, pp. 119-124.

Travis, C.C. and C.B. Doty, "Can Contaminated Aquifers at Superfund Sites Be Remediated?", Environmental Science and Technology, Vol., 24, No. 10, 1990, pp. 1464-1466.

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ATTACHMENT F - LETTER FROM EPA TO STEERING COMMITTEE, DATED MAY 6, 1991



5 2 0071  
UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION IV

345 COURTLAND STREET N.E.  
ATLANTA GEORGIA 30365

MAY 08 1991

4WD-NSRB

Ms. Mary Jane Norville  
King & Spalding  
2500 Trust Company Tower  
Atlanta, GA 30303

RE: Response to Comments On the Proposed Plan for the Medley  
Farm Superfund Site

Dear Ms. Norville:

The Agency received comments on the Proposed Plan from the Potentially Responsible Parties (PRPs) on April 12, 1991. The Agency presented the Proposed Plan to the public during a public meeting held on February 12, 1991. This meeting initiated the public comment period which ended on April 13, 1991, after a 30-day extension to the initial 30-day comment period.

In the April 12 correspondence, the PRPs outline their objections to the rationale used by EPA in selecting Soil Vapor Extraction (SVE) as a source control remedial measure. Their objections centered on two main points:

- o They question the necessity of source control measures, since the Baseline Risk Assessment indicates that Site soil contaminants do not pose a direct risk. In addition, they point out that recent EPA and other technical documents conclude that the time frames for aquifer remediation are underestimated, and that true time frames will in fact always exceed those made using models. The PRPs believe that SVE will not shorten the estimated time required to remediate Site groundwater to MCLs.
- o A cost comparison between SVE with a pump-and-treat system, and natural flushing with pump-and-treat, led the PRPs to conclude that natural flushing was a more cost-effective remedy.

The Agency agrees that the risk posed by contaminated site soils is indirect, through leaching to the groundwater. In selecting the proposed alternative, the Agency considered the entire contaminated subsurface, both the saturated and

-2-

unsaturated zones, as an integrated whole. The rationale of this approach was to obtain cleanup goals as quickly as technically and economically feasible.

The Agency agrees that levels of contaminants across parts of the Site are less than 1 milligram per kilogram (mg/kg). However, the Feasibility Study (FS) proposed installing the SVE system in those areas of the Site where elevated levels of contaminants in the soils were encountered. These areas are defined in Figure 4.2 of the Feasibility Study.

The PRPs discussed thoroughly the ineffectiveness of pumping/extracting groundwater as a clean-up method for aquifers. The PRPs also emphasized that the time frames for remediating the groundwater are generally underestimated. They also quoted one publication which states that not "a single aquifer in the United States has been confirmed to be successfully restored through pumping and treating." Their discussion was based on a review of technical studies of groundwater remediation, including EPA studies.

The Agency does not dispute the findings of these studies. However, the underestimation of time required for aquifer cleanup applies not only to the pump-and-treat of groundwater with residual soil contaminants having been removed during the first year (SVE); it also applies to the pump-and-treat undertaken 20 years later to remove the last contaminants entering the groundwater (natural flushing). In addition, it should be pointed out that one particular conclusion quoted by the PRPs, that "plume containment and mass reduction should be primary objectives of groundwater remediation", does not correspond to either EPA policy or the requirements of the NCP at this time.

In this regard, the PRPs note that trichloroethene (TCE) "is projected to impact groundwater above MCLs for approximately 20 years" (page 8). This is the time estimated to be required for natural flushing to remove all TCE (and other contaminants) from the soil. It is then stated near the top of this page that "remediation of Site groundwater is projected to take approximately 10 years assuming no flushing of additional contaminants into the groundwater."

The concentrations of contaminants which will be entering the groundwater in the 20th year of natural flushing are not known. The PRPs' assumption that only a 50% reduction in the concentrations present in the groundwater will be needed may not hold true; as they point out, there are uncertainties associated with the assumptions required by the computer models.

Therefore, based on the above, for TCE that enters the



-3-

groundwater in the 20th year of natural flushing, the estimate could range up to another 10 years for the contaminant to be removed from the aquifer by the groundwater pump-and-treat system, depending on the levels present in the groundwater.

Based on these provisions, the comparison made on page 10 and page 11 should use more than 11 years as the difference in time frames between the natural flushing alternative and the SVE alternative:

20 yrs N. flushing	vs.	10 yrs pump/treat
(incl. 10 yrs pump/treat)		(includes SVE)
+ 1 yr pump/treat for last		
<u>"50% reduction"</u>		
21 to ? yrs total		10 yrs total

The difference will be greater than 11 years: both values have the pump-and-treat "asymptote factor", described in the studies, which will cause them to be underestimates. But, the natural flushing alternative has an additional unknown: the length of additional pump-and-treat time necessary to remove the last TCE entering groundwater. The contaminant levels produced by this leaching will likely be very low, but still above MCLs: corresponding to those levels which take the longest to reduce. Additionally, if the attenuation/leaching model should also prove to have an "asymptote factor", contaminants may continue to enter the groundwater beyond 20 years, thus further delaying attainment of cleanup goals.

If only 5 years were required to bring residual concentrations down to MCLs, the additional costs for groundwater remediation at present worth costs (GR-PWC)\* would be:

$$\begin{aligned}
 \text{GR-PWC} &= \$81,000 \text{ (P/A: 16, 5\%)} \text{ (P/F: 10, 5\%)} \\
 &= \$81,000 (10.8378) (0.6139) \\
 &= \underline{\$539,000}
 \end{aligned}$$

If 8 years were required, GR-PWC would equal \$601,000, and if 10 years were necessary, \$638,000.

The present worth cost for SVE is \$620,000. The estimated savings generated by natural flushing are thus not greater than \$200,000; rather, the estimate more likely ranges between 0 and \$81,000. Such savings, if valid, are not substantial when measured against the estimated total cost (net present worth) of the remedy: \$1.2 million (10 yrs), \$1.8 million (30 yrs).

\* Same formula as used by PRPs.

These possible cost savings are not enough to justify selecting natural flushing as a source control remedy, which essentially equates to a "No Action" remedy for the contaminated soil areas.

In selecting a remedy, the Agency must evaluate two other criteria not mentioned by the PRPs. These are:

- o state acceptance/input
- o community acceptance/input

State and community representatives will not support this type of "No Action" scenario. The South Carolina Department of Health and Environmental Control (SCDHEC) has already verbally concurred with, and supports, the selected remedy.

Additionally, technical recommendations were considered. Two EPA technical publications which concern pump-and-treat systems are:

- o Basics of Pump-and-Treat Ground-Water Remediation Technology. EPA/600/8-90/003, March 1990.
- o Evaluation of Ground-Water Extraction Remedies. EPA/540/2-89/054, September 1989.

The latter document was referenced in the PRPs' comments. Both of these documents make clear recommendations that any and all residual source areas, whether above or below the water table, be removed or addressed by another treatment system. Use of multiple treatment technologies, such as that outlined in the remedy selected for this site, is common at CERCLA sites. In both documents, the recommendations are offered as methods to enhance and improve the effectiveness of pump-and-treat systems.


These recommendations, and the documents in general, support the Agency's opinion that, given the uncertainties associated with pump-and-treat remediation of contaminated groundwater, it makes sound economic and environmental sense to prevent or at least minimize the contaminant mass from moving from the unsaturated zone to the saturated zone, rather than waiting for the contamination to enter groundwater and then attempting to remediate the contamination. SVE is a proven technology which can remove VOCs and prevent them from migrating into the groundwater.

In summary, it is the Agency's opinion that the selected remedy is the best overall choice for remediation of both soil and groundwater at the Medley Farms Site. The natural flushing alternative is not acceptable because:

- o the underestimation of the time necessary for cleanup will apply to the groundwater pump-and-treat undertaken at the end of the natural flushing period, which is required to capture residual contaminants entering groundwater late in the 20-year natural flushing period
- o the cost savings may not be substantial and do not justify reliance on natural flushing
- o technical publications strongly recommend addressing residual source areas using a companion technology along with pump-and-treat (such as SVE)
- o the Agency believes it to be more logical to eliminate the residual source areas, since they are a potential problem which would likely affect the pump-and-treat system, by using SVE to remediate those areas.

Please address any questions or comments to the undersigned, or to Ralph Howard, the Remedial Project Manager who will be taking over guidance of the site following finalization of the Record of Decision.

Sincerely,

  
Jon K. Bornholm  
Remedial Project Manager